



TASHKENT MEDICAL ACADEMY

100 TMA ANNIVERSARY



# Journal of Educational and Scientific Medicine



**Issue 2 | 2025**



OAK.UZ  
Google Scholar

Science Director's Commission of the National  
Ministry of the Republic of Uzbekistan

**ISSN: 2181-3175**

# Risk Factors for Postoperative Complications After Laparoscopic Cholecystectomy

F.M. Abdurakhmanov<sup>1</sup>, N.S. Muzaffarov<sup>2</sup>

## ABSTRACT

*Laparoscopic cholecystectomy is currently considered one of the important approaches to the treatment of acute calculous cholecystitis in elderly and senile patients. According to the terms of the Tokyo Guidelines of 2018, laparoscopic cholecystectomy in elderly and senile patients should be performed immediately after establishing the general condition of the patient as mild or moderate severity. According to the Tokyo Guidelines of 2018, such a condition of the patient of elderly and senile age can be assessed as capable of tolerating laparoscopic cholecystectomy. This review article is devoted to the analysis of the current literature on risk factors for postoperative complications after laparoscopic cholecystectomy in elderly and senile patients.*

**Keywords:** acute obstructive cholecystitis, elderly and senile age, cholecystectomy

## INTRODUCTION

Historically, after the adoption of the diagnostic criteria of the Tokyo Guidelines in 2013, the studies carried out showed wide opportunities for their use in clinical practice and made it possible to conduct unified approaches to scientific research on the diagnosis and treatment of acute calculous cholecystitis in elderly and senile pa-

tients. The recommendations included in the 2013 Tokyo Guidelines were built on the consensus of world experts, which took place in 2007 in Tokyo, and it was considered the first version of this document.

According to this guideline, questions related to the assessment of the severity of acute calculous cholecystitis in elderly and senile patients with

<sup>1</sup> **Corresponding author:** Assistant of the Department of General and Pediatric Surgery, Tashkent Medical Academy, Tashkent, Uzbekistan, e-mail: [sardorruss@mail.ru](mailto:sardorruss@mail.ru)

<sup>2</sup> Surgeon of the Bukhara branch of the Republican Scientific Center for Emergency Medical Care, Bukhara, Uzbekistan, e-mail: [nodirbekmuzaffarov@gmail.com](mailto:nodirbekmuzaffarov@gmail.com)

planned cholecystectomy should be updated every 5 years, taking into account the accumulated clinical experience and the results of scientific research in this field of biliary surgery. This is how the 2013 guidelines were approved. However, there remained two main unresolved problems in the classification of the severity of acute cholecystitis in elderly and senile patients: the use of two categories for making a definitive diagnosis led to uncertainty in clinical practice, and the criteria for a suspected diagnosis were not specified.

## MATERIAL AND METHODS

The analysis of scientific literature was carried out by searching in databases of various catalogs for the period from 2015 to 2024. The key words were acute calculous cholecystitis, acute obstructive cholecystitis, cholelithiasis in elderly and senile patients, various factors of etiology and pathogenesis.

We also reviewed the literature on publications since the adoption of the 2013 Tokyo Guidelines and were able to obtain only 197 publications that were related to diagnostic and prognostic criteria, as well as classification of severity of acute cholecystitis. Another 19 articles were randomized controlled trials.

## RESULTS AND DISCUSSION

Analysis of the literature showed a very low proportion of data on the evidence of the significance of diagnostic sensitivity and the specificity of criteria for assessing the severity of the condition of patients with acute cholecystitis. The imbalance between the prognostic significance of the signs of acute cholecystitis in elderly and senile patients was reduced between the 2017 Tokyo Guidelines and Murphy's sign, the specificity of which turned out to be much greater than the sensitivity. Nevertheless, many authors in their publications came to the conclusion that it is necessary to conduct further research aimed at improving the specificity and sensitivity of diagnostic criteria for making a final diagnosis and ascertaining the general condition of elderly and senile patients. Naturally, the easiest thing would be to change the factors that are used to assess the condition of a patient with acute cholecystitis in the elderly and senile age. However, the studies were aimed at finding new diagnostic criteria, among which local and systemic signs of inflammation were significant, which can characterize the severity of the course of acute cholecystitis among elderly and senile patients.

Making a final diagnosis required the use of additional visual research methods. The use of this approach in the diagnosis and assessment of the general condition of a patient with acute cholecystitis in the elderly and senile age led to an increase in the sensitivity and specificity of the criteria to 91.2% and to 96.9%, respectively. It was these research results that served as the basis for the review and approval of the new diagnostic criteria of the Tokyo Guidelines in 2013. It should be noted that in 2013 there was no special emphasis on the prognostic signs of local and systemic inflammation in acute cholecystitis in elderly and senile patients. In this regard, the 2007 recommendations fully formed the basis of the 2013 Tokyo Recommendations.

However, already in 2017, Takada T. [1] in his article "How far we have come since the adoption of the 2013 Tokyo Guidelines" expressed concern about the lack of evidentiary criteria in preparation for the publication of the 2013 Tokyo Guidelines. This conclusion was obtained after a full-scale joint study between clinicians in Japan and Taiwan on the epidemiological survey of acute biliary tract infections, including in elderly and senile patients. In this study, data from more than 7000 clinical cases were collected, among which 5000 patients with acute calculous cholecystitis were used to describe the patient's characteristics, clinical presentation of the disease, and diagnostic criteria for the manifestation of acute calculous cholecystitis. All these data were compared with the criteria of the 2013 Tokyo Guidelines, which became the basis for their subsequent revision.

Incorporating big data validation into the revision work is far from common, but it is fair to say that the revision of the 2018 Tokyo Guidelines is based on clinical data.

For example, in the work of J.I. Gonzalez-Munoz et al. [2] It was found that the classification of the severity of acute cholecystitis, especially among elderly and senile patients, plays a useful role in predicting the functional state of vital organs.

Relatively earlier, G. Paul Wright et al. [3] published the results of their own studies and concluded that the duration of hospitalization and the proportion of laparoscopic cholecystectomy conversions were significantly higher in the more severe condition of patients with acute cholecystitis.

Opposing information was presented in the publications of D. Kamalapurkar et al. [4], as well as V. Amirthalingam et al. [5], which have shown that severe cholecystitis can be surgically treated, even if percuta-

neous cholecystostomy is not always feasible and open cholecystectomy may be required.

Multivariate analysis based on data from a multicenter cohort study conducted by clinicians in Japan and Taiwan was carried out by I. Endo et al. [6] in 2017. Using the results obtained earlier, it was necessary to propose a new treatment strategy in accordance with the classification of severity of acute cholecystitis according to the 2013 Tokyo guidelines.

The prognosis of acute cholecystitis in the previous version of the Tokyo Guidelines, in the opinion of most clinicians, was relatively perfect in determining the severity of the disease. Discussions in this area are ongoing. Thus, based on the results of such discussions, in 2007 it was decided to include organ failure in patients with acute cholecystitis in the elderly and senile age, which can directly affect postoperative survival. All of them were to be classified as grade III, known as severe.

In patients with acute cholecystitis in the elderly and senile, it is recommended to make every effort to avoid any risk of complications after laparoscopic cholecystectomy. As a medical and economic advantage, laparoscopic cholecystectomy is justified in its use as an early surgical intervention in acute cholecystitis.

In order to confirm this conclusion in the studies of S. Gourgiotis et al. [7], as well as S. Eldar et al. [8] conducted a full-scale analysis of the results of treatment of patients with acute cholecystitis in the elderly and senile age, including the remote periods of the postoperative period.

Meanwhile, A. Brodsky et al. [9], P.M. Terho et al. [10], as well as M. Radunovic et al. [11] noted relatively frequent cases of postoperative purulent-inflammatory and other types of complications after laparoscopic cholecystectomy for acute cholecystitis among elderly and senile patients. In this regard, the authors point out the importance of assessing the risk of early postoperative complications of laparoscopic cholecystectomy in acute cholecystitis with the indispensable use of risk criteria for the preoperative period.

It is also necessary to take into account the data obtained during the operation, that is, intraoperative data. Among the predictors of postoperative complications, criteria such as the patient's age, gender, body mass index, total bilirubin, white blood cell count, C-reactive protein level, kidney function and ultrasound results were discussed. According to the 2018 Tokyo Guidelines, early laparoscopic cholecystectomy is recommended if the patient's overall condition is assessed as

good according to the criteria of the Charlson Comorbidity Index and the American Society of Anesthesiologists.

Thus, according to F. Miura et al. [12] Initial management of patients with suspected acute biliary infection should begin with an assessment of the functional status of vital organs to determine whether the situation is urgent. If the case is considered urgent, primary care should be started immediately, including respiratory and circulatory support, if necessary, without waiting for a definitive diagnosis to be identified. The next step is to collect the history of the disease and examine the abdominal organs. At the same time, it is necessary to carry out blood and urine tests, as well as methods of visual diagnostics (ultrasound, MSCT, MRI). A diagnosis is required with verification of the presence or absence of acute inflammation of the biliary tract. Once the diagnosis is confirmed, initial treatment should be initiated immediately, severity should be assessed according to the severity classification criteria for acute cholecystitis with cholangitis, and the patient's general condition should be assessed.

In mild acute cholangitis, initial treatment including antibiotics is sufficient in most cases, and most patients do not require biliary drainage. However, biliary drainage should be considered if the patient does not respond to initial treatment. In moderate acute cholangitis, early endoscopic or percutaneous transhepatic drainage of the biliary tract is indicated. If the underlying etiology requires treatment, it should be provided after the patient's general condition has improved.

Endoscopic sphincterotomy and subsequent choledocholithotomy can be performed along with biliary drainage. In severe acute cholangitis, appropriate control of the respiratory system and hemodynamics is required. Biliary drainage should be performed as soon as possible after improvement of the patient's general condition by initial treatment and respiratory and haemodynamic monitoring. The purpose of applying the above criteria and severity of acute cholecystitis in elderly and senile patients is considered relatively safe when performing laparoscopic cholecystectomy.

When assessing potential risk factors for the development of postoperative complications during laparoscopic cholecystectomy in elderly and senile patients, the possibility of their development according to the results of the study is equated to 8.6% to 35.4%.

In their publication, M. Yokoe et al. [13] reported that 2,130 patients (39.0%) were classified as grade I (mild), 2,308 as grade II (moderate), and 939 as grade III (severe). In Japan, laparoscopic cholecystectomy is routine-

ly performed for cholecystitis, not only in emergency care centers but also in small or medium-sized hospitals. The surgical technique and methodology of perioperative care for laparoscopic cholecystectomy are largely documented in the 2018 Tokyo Guidelines and other studies.

In the literature we have established that moderate (grade I) or severe (grade II) cholecystitis and the assessment of physiological and surgical severity according to the mortality and morbidity scale are independent risk factors for postoperative complications.

Back in 1991, G.P. Copeland et al. [14] noted that the scale of physiological and surgical severity for assessing mortality is a method for assessing the risk of surgical complications, including factors related to the pre- and postoperative state and other equally important data. In general, based on the data obtained, it can be stated that the high risk of postoperative complications during laparoscopic cholecystectomy in elderly and senile patients may be associated with the perioperative general condition. However, the 2018 Tokyo Guidelines recommend assessing the patient's general condition using the Charlson Comorbidity Index and the American Society of Anesthesiologists in a flowchart of initial medical care and organ support, but research on risk factors for postoperative complications in laparoscopic cholecystectomy has been insufficient so far.

Reliable risk factors for perioperative complications in patients undergoing laparoscopic cholecystectomy would be extremely useful in optimizing clinical management. Based on this consideration, U.F. Giger et al. [15] conducted a study aimed at determining risk factors that are appropriate for use in predicting perioperative complications.

They were analysed using a stepwise logistic regression model using data from the Swiss Association for Laparoscopic and Thoracoscopic Surgery (SALTS) database to identify possible risk factors for perioperative complications in patients undergoing laparoscopic cholecystectomy for acute and chronic cholecystitis. A total of 22,953 patients with a mean age of  $54.5 \pm 16.1$  years and a male-to-female ratio of 1:2 underwent elective (85%) and emergency (15%) laparoscopic cholecystectomy. Multivariate analysis showed that factors such as male sex, duration of intervention, body weight, and the surgeon's own experience were independently associated with an increased incidence of intraoperative local complications. In addition, male sex, age, intraoperative complications, transition to open surgery, American Society of Anesthesiologists risk score, body weight, emergency surgery, and duration of surgery were associated

with a higher incidence of postoperative local complications. Higher postoperative systemic complications have been reported with conversion, American Society of Anesthesiologists risk assessment, emergency surgery, and long intervention time.

As a result of the studies, it was concluded that for patients undergoing laparoscopic cholecystectomy, the risk of possible perioperative complications can be assessed based on the patient's characteristics (gender, age, ASA score, body weight), clinical findings (acute and chronic cholecystitis) and the surgeon's own clinical practice in performing laparoscopic cholecystectomy.

According to the results of the study, M.M. Murphy et al. In 2019 [16], the regionalization of medical care for complex surgeries was proposed based on the relationship between volume and mortality between the hospital and the surgeon. However, during this period, there was some disagreement about whether more common procedures should be performed in high-volume centers. The use of mortality alone to assess routine operations is hampered by relatively low perioperative mortality. In this regard, after 1 year, a group of clinicians led by M.M. Murphy et al. [17] used an extensive national database to analyze the risk of serious in-hospital complications after laparoscopic cholecystectomy in elderly and senile patients.

Patients undergoing laparoscopic cholecystectomy were identified in a nationwide sample of inpatients from states with surgeon or hospital IDs. Previously confirmed major complications including acute myocardial infarction, pulmonary failure, postoperative infection, deep vein thrombosis, pulmonary embolism, hemorrhage, and resurgery were evaluated. Univariate and multivariate analyses were performed and independent risk factors for complications were identified. A total of 1,102,071 weighted patient discharges were identified with a complication rate of 6.8%. A univariate analysis found that older age, male sex, and a higher Charlson comorbidity score were associated with a higher incidence of complications. A higher volume of surgical interventions and a greater volume of hospitalization were associated with fewer complications. Multivariate analysis showed that older age, male sex, and comorbidities were associated with complications. Neither the surgeon nor the amount of hospitalization was independently associated with an increased risk of complications.

Most likely, careful patient selection and preoperative preparation can reduce the overall complication rate. A number of other researchers came to this opinion. As independent risk factors for postoperative complications

in laparoscopic cholecystectomy, the literature mentions such predictors as the patient's age, gender, the presence and severity of the development of concomitant pathology, body mass index, the presence of fever and the transfer of laparoscopic cholecystectomy to an open form of surgery, that is, conversion. These publications show that the assessment of the patient's general condition, which allows predicting the potential for postoperative complications, was very important for the perioperative management of laparoscopic cholecystectomy.

Despite the fact that early laparoscopic cholecystectomy is widely used in acute cholecystitis, the optimal timing of cholecystectomy in elderly and senile patients remains controversial. In order to determine the optimal tactics for acute cholecystitis in elderly and senile patients, focused on the severity of the disease and concomitant diseases, a group of Japanese scientists from the Department of Gastroenterological Surgery, Graduate School of Medicine of the Yokohama City University (Kanagawa) under the leadership of I. Endo [18] conducted an international multicenter retrospective observational study in 5,329 patients over a period of 2 years. Patients were divided into four groups: Group A: primary cholecystectomy; Group B: cholecystectomy after gallbladder drainage; Group C: gallbladder drainage only; and Group D: drug treatment only.

Based on the results of the studies, statistically significant differences in mortality rates between patients with a Charlson comorbidity index below and above 6 were revealed. The shortest surgery time was observed in Group A patients who underwent surgery 0–3 days after admission. Multiple regression analyses showed that the Charlson Comorbidity Index and low body mass index <20 are predictive factors for 30-day mortality in Grade I-II patients. In addition, jaundice, neurological dysfunction, and respiratory dysfunction were predictors of 30-day mortality in Grade III patients. In Grade III patients without prognostic factors, there was no difference in mortality between Groups A and B, whereas in Group A patients, mortality was higher than in Group B patients in cases with at least one prognostic factor.

Based on the results of the studies, it was concluded that even in patients with grade III severity, primary cholecystectomy can be performed safely if they do not have prognostic mortality factors. Gallbladder drainage may play a therapeutic role in subgroups with a higher Charlson comorbidity index or higher disease severity.

Laparoscopic cholecystectomy for acute cholecystitis in elderly and senile patients with organ dysfunction can be a deadly operation, so it is necessary to improve the

general condition of patients before laparoscopic cholecystectomy is performed.

Taking into account the available data on the scale of physiological and surgical severity to assess mortality, morbidity and severity of cholecystitis as potential risk factors, these factors can be used to predict and prevent postoperative complications in elderly and senile patients. Prevention of postoperative complications using these factors is especially important. There are several methods for improving the preoperative condition in cases of acute cholecystitis in elderly and senile patients. The 2018 Tokyo guidelines indicate antimicrobial therapy and percutaneous hepatic drainage of the gallbladder in patients with acute cholecystitis at high surgical risk as an alternative to urgent laparoscopic cholecystectomy. Supplementing this tactic with active antibacterial therapy can significantly improve the results of laparoscopic cholecystectomy in elderly and senile patients.

Percutaneous transhepatic cholecystostomy is a method for improving the course of acute cholecystitis, and its therapeutic role in elderly and senile patients with severe or moderate cholecystitis has been discussed in several studies.

Clinicians recognize that it is preferable to perform laparoscopic cholecystectomy for acute cholecystitis in the acute phase, within 72 hours of the onset of symptoms. The feasibility and safety of performing urgent laparoscopic cholecystectomy in the late phase (4–7 days after the onset of symptoms) is unclear.

The aim of the study was G. Shinke et al. [19] was the clarification of the expediency and safety of the late phase of urgent laparoscopic cholecystectomy. Between 2005 and 2014, the authors performed emergency laparoscopic cholecystectomy on 233 patients for acute cholecystitis within 7 days. They compared clinical features and perioperative outcomes between patients who underwent laparoscopic cholecystectomy within 3 days (early phase) and 4 to 7 days after symptom onset (late phase). There were 193 patients in the early phase group and 40 patients in the late phase group. Performing laparoscopic cholecystectomy in the late phase did not affect the duration of the operation, postoperative complications and hospital stay after surgery. The conversion rate to open surgery and blood loss were slightly higher in the late phase group (8% and 140 mL) compared to the early phase group (3% and 69 mL), but were still acceptable. Thus, the late phase of urgent laparoscopic cholecystectomy for acute cholecystitis was feasible and safer.



The data obtained showed that percutaneous hepatic drainage of the gallbladder was performed only in 4.5% of patients with cholecystitis, and urgent laparoscopic cholecystectomy after 72 hours was performed only in 17.5% of cases. The 2018 Tokyo guidelines recommend early laparoscopic cholecystectomy for grade I (mild) cholecystitis, as well as antibiotics and general supportive care initially for grade II (moderate) cholecystitis, followed by early or elective laparoscopic cholecystectomy.

Both preoperative antibiotics and percutaneous hepatic drainage of the gallbladder may be helpful in preventing postoperative complications. Other methods of improving the preoperative condition have rarely been discussed. The Physiological and Operational Severity Scale for mortality assessment includes the Physiological Scale, which contains 12 preoperative physiological variables, and the Operational Severity Scale, which contains six operational variables.

Physiological evaluation and assessment of the severity of surgery may be goals to improve the condition of patients who have undergone laparoscopic cholecystectomy. In the physiological scale of physiological and operative severity for the assessment of mortality, the parameters of hemoglobin, white blood cell count, urea, sodium and potassium can be easily improved before laparoscopic cholecystectomy with appropriate fluid and antibiotic replacement. However, for laparoscopic cholecystectomy, effective methods have not yet been developed to improve the factors associated with assessing the severity of surgery. Reducing blood loss during laparoscopic cholecystectomy may be the only viable method, but its effect may be negligible due to the usually small amount of bleeding during laparoscopic cholecystectomy. The physiological and operational severity scale for mortality assessment includes both preoperative and intraoperative conditions.

The assessment of the severity of surgery can be predicted in part based on the severity of cholecystitis. If the assessment of physiological and surgical severity to reduce mortality exceeds the threshold point after laparoscopic cholecystectomy, then postoperative management of the patient's general condition may be difficult. In this regard, patients with a high assessment of physiological and operational severity on the mortality scale should be provided with intensive medical care. Preoperative conservative treatment before laparoscopic cholecystectomy is very important if the physiological indicator is high. In this regard, it is important to assess the scale of physio-

logical and surgical severity to reduce mortality before laparoscopic cholecystectomy.

The Physiological and Surgical Severity Scale for mortality is used to analyze the risk of postoperative complications in many surgical procedures. However, such tests for laparoscopic cholecystectomy were rare. A.L.Tambyraja et al. [20] showed that the assessment of physiological and surgical severity for the assessment of mortality showed itself well in predicting morbidity after laparoscopic cholecystectomy in elderly and senile patients.

The reason for the transition to open cholecystectomy in almost all cases is the difficulty in performing laparoscopic cholecystectomy due to progressive inflammation, fibrosis and adhesions of the gallbladder. Difficulties in performing laparoscopic cholecystectomy can lead to postoperative complications. Several studies have found that switching to open cholecystectomy in laparoscopic cholecystectomy is a risk factor for postoperative complications. However, switching to open cholecystectomy was not a risk factor for postoperative complications after laparoscopic cholecystectomy, although why this was true was unclear. In addition, no studies have yet described the feasibility of conversion to open cholecystectomy. An appropriate conversion strategy can help prevent post-operative complications. Physiological and operative severity scales for reduced mortality and moderate or severe cholecystitis were potential risk factors for postoperative complications.

Thus, preoperative management of general condition and cholecystitis using antibiotics, infusion, and percutaneous transhepatic gallbladder drainage can help prevent postoperative complications. Once the physiological and operational severity scale for reduced mortality reaches the threshold after laparoscopic cholecystectomy, postoperative management becomes difficult, and strict monitoring of the general condition should be carried out.

## CONCLUSION

**I**n the case of severe acute cholecystitis among elderly and senile patients, the assessment of the patient's condition as a deterioration of the condition should determine the therapeutic tactics based on the data of the comorbid background, including the presence of all concomitant diseases, even if they are in remission. At the same time, known scoring systems may be useful for assessing the risk of early postoperative complications after laparoscopic cholecystectomy.

In the event that it is likely to be a "complex cholecystectomy", an experienced surgeon should be involved in both the decision-making process and the surgery. If a

laparoscopic cholecystectomy lasts more than 2 hours, the cumulative risk of perioperative complications is four times higher compared to an intervention that lasts 30 to 60 minutes, regardless of the surgeon's personal skills in the field of this type of surgery.

The main in-hospital complications after laparoscopic cholecystectomy are related to the individual data of the patient, and not to the surgeon or the surgical volumes in the hospital. These results suggest that regionalization of common surgical procedures may not be necessary. The ideal approach to risk management in cases of laparoscopic cholecystectomy in patients with severe cholecystitis with organ failure in the elderly and in old age should be differentiated from the treatment approach to patients with severe cholecystitis with low platelet counts.

Preoperative prognosis of postoperative complications in laparoscopic cholecystectomy may not be appropriate. The physiological and operational severity scale for the physiological mortality scale reflects the preoperative condition of patients, so the physiological assessment may vary widely among patients. The Physiological and Surgical Severity Scale for assessing the severity of surgery is an intraoperative score that depends on the surgical procedure such as cholecystectomy for cholecystitis.

**Conflict of interest** – none

**Study funding** – not provided

**Ethical aspects** – complied

#### REFERENCES:

1. Takada T. How far have we progressed since the Tokyo Guidelines 2013? *J Hepatobiliary Pancreat Sci.* - 2017; 24(6):307-309.
2. González-Muñoz J.I., Franch-Arcas G., Angoso-Clavijo M. Risk-adjusted treatment selection and outcome of patients with acute cholecystitis. // *Langenbecks Arch Surg.* - 2017; 402: 607–14.
3. Paul Wright G., Stilwell K., Johnson J. Predicting length of stay and conversion to open cholecystectomy for acute cholecystitis using the 2013 Tokyo Guidelines in a US population. // *J. Hepatobiliary Pancreat. Sci.* - 2015; 22: 795–801.
4. Index cholecystectomy in grade II and III acute calculous cholecystitis is feasible and safe. / D. Kamalapurkar, T.C. Pang, M. Siriwardhane, et al. // *ANZ J. Surg.* 2015; 85: 854–9.
5. Tokyo Guidelines 2013 may be too restrictive and patients with moderate and severe acute cholecystitis can be managed by early cholecystectomy too. / V.

Amirthalingam, J.K. Low, W. Woon, V. Shelat. // *Surg. Endosc.* 2017; 31: 2892–900.

6. Optimal treatment strategy for acute cholecystitis based on predictive factors: Japan-Taiwan multicenter cohort study. / I. Endo, T. Takada, T.L. Hwang, et al. // *J. Hepatobiliary Pancreat. Sci.* 2017; 24: 346–61.

7. Laparoscopic cholecystectomy: a safe approach for management of acute cholecystitis. / S. Gourgiotis, N. Dimopoulos, S. Germanos, et al. // *JSL J. Soc. Laparoendosc. Surg.* 2021;11(2):219–224.

8. Laparoscopic cholecystectomy for acute cholecystitis: prospective trial. / S. Eldar, E. Sabo, E. Nash, et al. // *World J. Surg.* 2021;21(5):540–545.

9. Laparoscopic cholecystectomy for acute cholecystitis: can the need for conversion and the probability of complications be predicted? A prospective study. / A. Brodsky, I. Matter, E. Sabo, et al. // *Surg. Endosc.* 2020;14(8):755–760.

10. Terho P.M., Leppaniemi A.K., Mentula P.J. Laparoscopic cholecystectomy for acute calculous cholecystitis: a retrospective study assessing risk factors for conversion and complications. // *World J. Emerg. Surg.* 2016;11(1):54.

11. Radunovic M., Lazovic R., Popovic N. Complications of laparoscopic cholecystectomy: Our experience from a retrospective analysis. // *Open Access. Maced. J. Med. Sci.* 2016;4(4):641–646.

12. Tokyo Guidelines 2018: initial management of acute biliary infection and flowchart for acute cholangitis. / F. Miura, K. Okamoto, T. Takada, et al. // *J. Hepatobiliary Pancreat. Sci.* 2018;25(1):31–40.

13. Descriptive review of acute cholecystitis: Japan-Taiwan collaborative epidemiological study. / M. Yokoe, T. Takada, T.L. Hwang, et al. // *J. Hepatobiliary Pancreat. Sci.* 2017;24(6):319–328.

14. Copeland G.P., Jones D., Walters M. POSSUM: a scoring system for surgical audit. // *Br. J. Surg.* 1991;78(3):355–360.

15. Risk factors for perioperative complications in patients undergoing laparoscopic cholecystectomy: analysis of 22,953 consecutive cases from the Swiss Association of Laparoscopic and Thoracoscopic Surgery Database. / U.F. Giger, J.M. Michel, I. Opitz, et al. // *J. Am. Coll. Surg.* 2016;203(5):723–728.

16. Predicting major complications after laparoscopic cholecystectomy: a simple risk score. / M.M. Murphy, S.A. Shah, J.P. Simons, et al. // *J. Gastrointest. Surg.* 2019;13(11):1929–1936.

17. Predictors of major complications after laparoscopic cholecystectomy: surgeon, hospital, or patient? /



M.M. Murphy, S.C. Nag, J.P. Simons, et al. // *J. Am. Coll. Surg.* 2020;211(1):73–80.

18. Optimal treatment strategy for acute cholecystitis based on predictive factors: Japan-Taiwan multicenter cohort study. / I. Endo, T. Takada, T.L. Hwang, et al. // *J. Hepatobiliary Pancreat. Sci.* 2017; 24(6): 346-361.

19. Feasibility and safety of urgent laparoscopic cholecystectomy for acute cholecystitis after 4 days from

symptom onset. / G. Shinke, T. Noda, H. Hatano, et al. // *J. Gastrointest. Surg.* 2015; 19(10):1787–1793.

20. Tambyraja A.L., Kumar S., Nixon S.J. POSSUM scoring for laparoscopic cholecystectomy in the elderly. // *ANZ J. Surg.* 2015;75(7):550–552.

## LAPAROSKOPIK XOLESISTEKTOMIYADAN SO'NG OPERATSIYADAN KEYINGI ASORATLARNING XAVF OMILLARI

<sup>1</sup>Abduraxmanov F.M., <sup>2</sup>Muzaffarov N.S.

<sup>1</sup>Toshkent tibbiyot akademiyasi

<sup>2</sup>Respublika shoshilinch tibbiy yordam ilmiy markazining Buxoro filiali

### XULOSA

Laparoskopik xolesistektomi hozirgi kunda keksa va qari bemorlarda o'tkir kalkuloz xolesistitni davolashda muhim yondashuvlardan biri hisoblanadi. 2018 yilgi Tokio ko'rsatmalari shartlariga ko'ra, keksa va qari bemorlarda laparoskopik xolesistektomiya bemorning umumiy holatini engil yoki o'rtacha og'irlik deb aniqlagandan so'ng darhol amalga oshirilishi kerak. 2018 yilgi Tokio ko'rsatmalariga ko'ra, keksa va qarilik yoshidagi bemorning bunday holati laparoskopik xolesistektomiyaga chidamli deb baholanishi mumkin. Ushbu maqola keksa va qari bemorlarda laparoskopik xolesistektomiyadan keyingi operatsiyadan keyingi asoratlarning xavf omillari to'g'risidagi dolzarb adabiyotlarni tahlil qilishga bag'ishlangan.

**Kalit so'zlar:** O'tkir obstruktiv xolesistit, keksalik va qarilik davri, xolesistektomi

## ФАКТОРЫ РИСКА ПОСЛЕОПЕРАЦИОННЫХ ОСЛОЖНЕНИЙ ПОСЛЕ ЛАПАРОСКОПИЧЕСКОЙ ХОЛЕЦИСТЭКТОМИИ

<sup>1</sup>Абдурахманов Ф.М., <sup>2</sup>Музаффаров Н. С.

<sup>1</sup>Ташкентская медицинская академия

<sup>2</sup>Бухарский филиал республиканского научного центра экстренной медицинской помощи

### АБСТРАКТ

Лапароскопическая холецистэктомия на сегодняшний день считается одним из важных подходов к лечению острого калькулезного холецистита у больных пожилого и старческого возраста. Согласно условиям Токийских рекомендаций от 2018 года лапароскопическую холецистэктомию у больных пожилого и старческого возраста необходимо выполнять сразу же после установки общего состояния больного как легкой или умеренной тяжести. По утверждению Токийских рекомендаций от 2018 года такое состояние больного пожилого и старческого возраста может быть оценено как способное перенести лапароскопическую холецистэктомию. Данная обзорная статья посвящена анализу современной литературы относительно факторов риска послеоперационных осложнений после лапароскопической холецистэктомии у больных пожилого и старческого возраста.

**Ключевые слова:** острый обструктивный холецистит, пожилой и старческий возраст, холецистэктомия